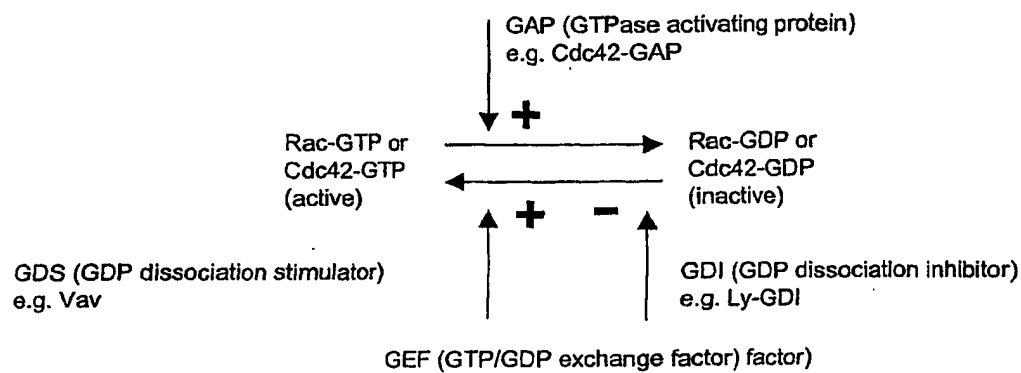TITLE: GENES INVOLVED IN IMMUNE RELATED RESPONSES
OBSERVED WITH ASTHMA
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Figure 1.

GAP (GTPase activating protein)
e.g. Cdc42-GAP

Rac-GTP or
Cdc42-GTP
(active)

Rac-GDP or
Cdc42-GDP
(inactive)

GDS (GDP dissociation stimulator)
e.g. Vav

GDI (GDP dissociation inhibitor)
e.g. Ly-GDI

GEF (GTP/GDP exchange factor) factor)

TITLE: GENES INVOLVED IN IMMUNE RELATED RESPONSES
OBSERVED WITH ASTHMA
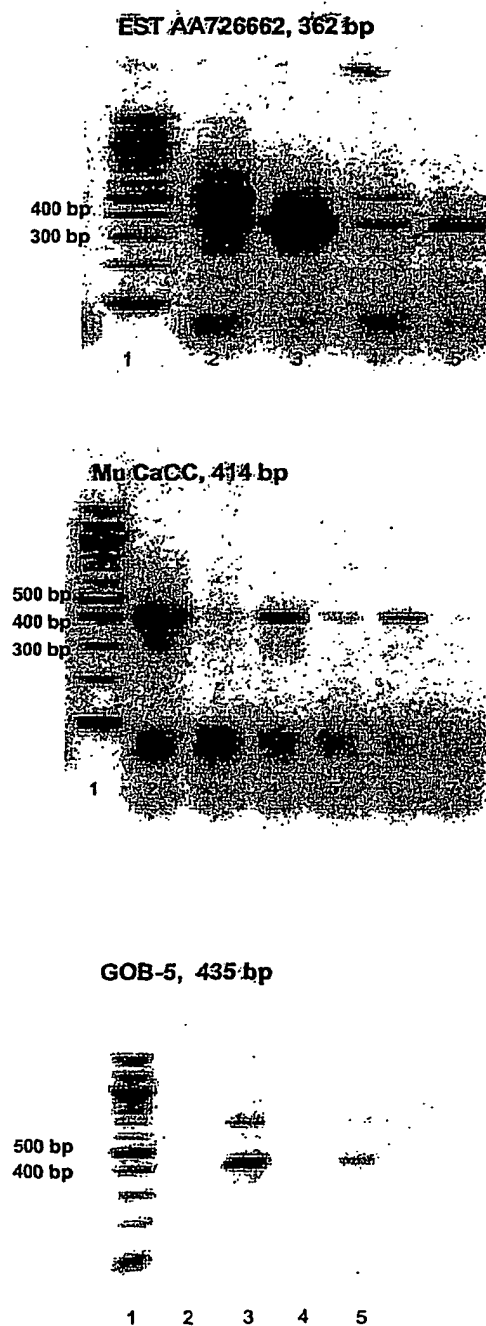Inventor: Grout et al.
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Figure 2:

EST AA726662, 362 bp

MuCaCC, 414 bp

GOB-5, 435 bp

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OBSERVED WITH ASTHMA
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Figure 3.

IgE receptor.

```
CLUSTAL W (1.81) multiple sequence alignment


ige_r_beta_mouse    MDTENRSRADLALPNPQESSSAPDIELLEASP----------AKAAPPKQTWRTFLKKEL 50
ige_r_beta_human    MDTESNRRANLALP--QEPSSVPAFEVLEISPQEVSSGRLLKSASSPPLHTWLTVLKKEQ 58
lr8_mouse           MVQSTVTVNGVKVASTHPQSAHISIHIHQKSALEQLLG---AVGSLKKFLSWP------Q 51
lr8_human           MTQNTVIVNGVAMASRHAQPTHVNVHIHQESALTQLLK---AGGSLKKFLPHPGDTVSST 57
                     *  ..    .: :.  :  .:   ..: : *.              :


ige_r_beta_mouse    EFLGATQILVGLICLCFGTIVCSVLYVSDFDEEVLLLYKLGYPFWGAVLFVLSGFLSIIS 110
ige_r_beta_human    EFLGVTQILTAMICLCFGTVVCSVLDISHIEGDIFSSFKAGYPFWGAIPFSISGMLSIIS 118
lr8_mouse           ARVHYGQLSLGVTQILLGLVSC-ALGVCLYFGPWTELCAFGCAFWSGSVAILAGVGTIVH 110
lr8_human           ARIGYEQLALGVTQILLGVVSC-VLGVCLSLGPWTVLRASGCAFWAGSVVIAAGAGAIVH 116
                      :   *:  .:  : :*  :  *  .*  :.          * .**..    :*   :*:


ige_r_beta_mouse    ERKNTLYLVRGSLGANIVSSIAAGTGIAMLILN-------------------------LT 145
ige_r_beta_human    ERRNATYLVRGSLGANTASSIAGGTGITILIIN-------------------------LK 153
lr8_mouse           EKRQGK-LSGQVSCLLLLACIATAAAATVLGVNSLIRQTSVPYYVBIFS-TCNPLQSSMD 168
lr8_human           EKHPGK-LAGYISSLLTLAGFATAMAAVVLCVNSFIWQTBPFLYIDTVCDRSDPVFP--T 173
                    *::    *          :  :*  .  ..:*  :*


ige_r_beta_mouse    NNFAYMN--NCKNVTEDDGCFVASFTTELVLMMLFLTILAFCSAVLFTIYRIGQELESKK 203
ige_r_beta_human    KSLAYIHIHSCQKFFETK-CFMASFSTEIVVMMLFLTILGLGSAVSLTICGAGEELKGNK 212
lr8_mouse           PGYGTVRYSDDSDWKTERCREYLNMMMNLFLAFCIMLTVVCILEIVVSVASLGLSLRSMY 228
lr8_human           TGYRWMRRSQENQWQKEECRAYMQMLRKLFTAIRALFLAVCVLKVIVSLVSLGVGLRNLC 233
                     .   :.  . ..        .:  :i.  :  :        :  .::   *  *...


ige_r_beta_mouse    VPDDRLYEELNVYSPIYSELEDKGETSSPVDS----- 235
ige_r_beta_human    VPEDRVYEELNIYSATYSELEDPGEMSPPIDL----- 244
lr8_mouse           GRSSQALNEEESERKLLDGHPAPASPAKEKISAIL-- 263
lr8_human           GQSSQPLNEEGSEKRLLGENSVPPSPSREQTSTAIVL 270
                     ..:  :*            .     . :
```

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Figure 4

Sequence R1-OS-B1-E5:

Gatcaaatgtattctttgttacctcaggggcttcaggggctaggtgacaactccccagggctagaaaggtaagccca

tctaagtgttacaggagtgattttttgcctgtgactttgagatgcccaattagaaccagcctctggcccacctntcctg

gggaagcgacaatgagattgcctttatacttcacctggtgcctaggcttgctcttaggcatccattttcctggtgagac

tttcttcatgtcacagaagccagcaaataggtggagtcacatgaaggntcatgatc

Sequence OtS2-C5:

Agattgtttgagggataatgatttcaagtgtttagcatctgagcctgcctgtaggttgatttcatctatttttagtaa

acaagcattctttgttagtcaacatatcacatcaaatatgcggagcattttaaaaagctacttcatcctttggcattca

catcatctagtcaaacagggtttcaagtgcagacggncacttgcacatgtagcgtggcacatcanataccggtgtgt

gatgtgaanctcacacaggggtgttatctgaagcataatggtggcttgggtaatatacatataagctcaanggnac

cncgaatttccttggaaagaacatnaacctgggaancttttggngncccttacctgcctgnctaanaaacttgacc

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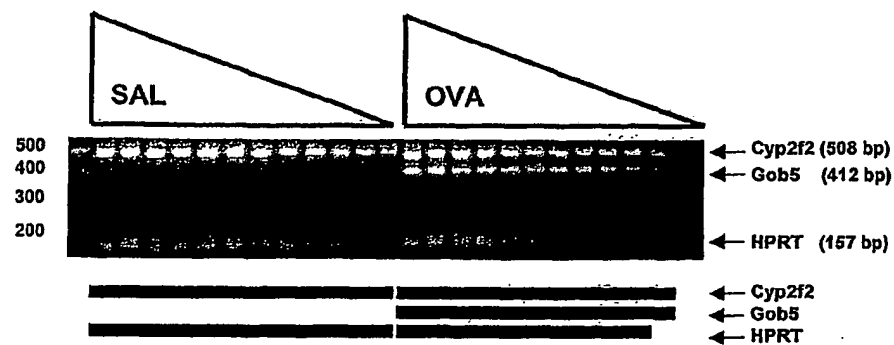Docket No.: 2183-6143US

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Figure 5A
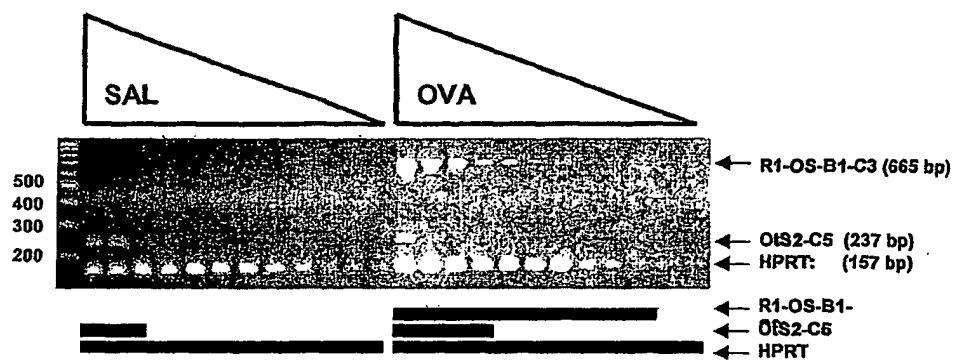
TITLE: GENES INVOLVED IN IMMUNE RELATED RESPONSES
OBSERVED WITH ASTHMA
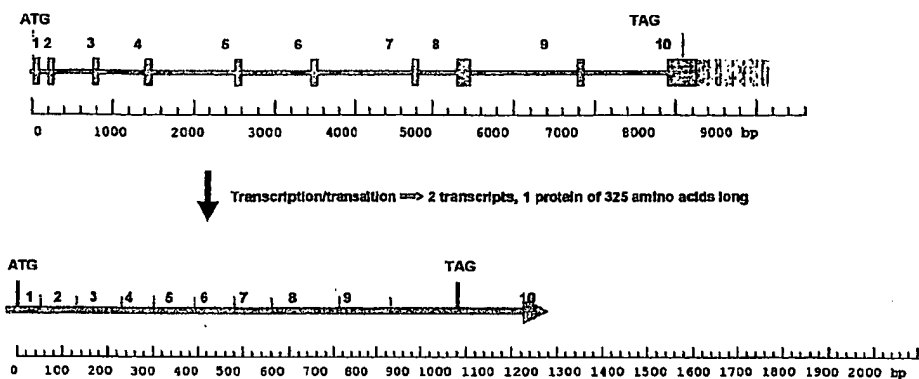Inventor: Grout et al.
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Figure 5B

TITLE: GENES INVOLVED IN IMMUNE RELATED RESPONSES
OBSERVED WITH ASTHMA
Inventor: Grout et al.
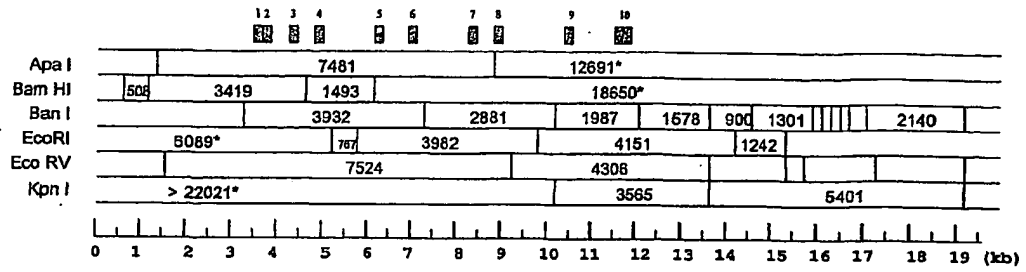Docket No.: 2183-6143US

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Figure 6

TITLE: GENES INVOLVED IN IMMUNE RELATED RESPONSES
OBSERVED WITH ASTHMA
Inventor: Grout et al.
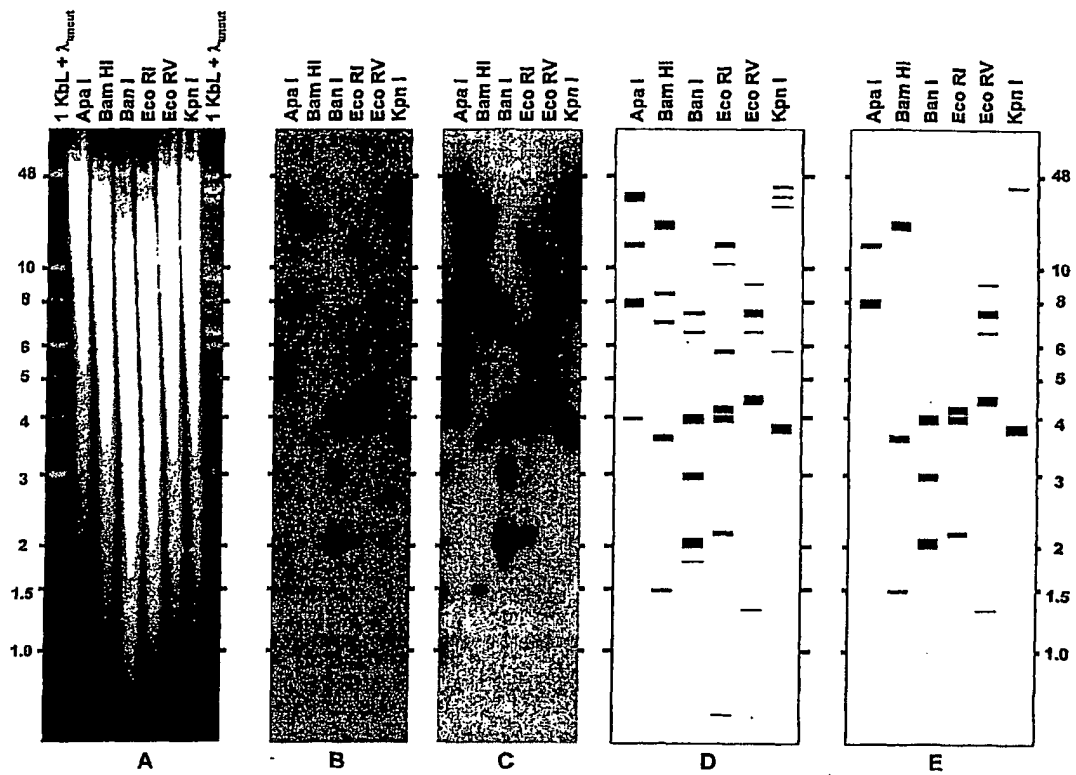Docket No.: 2183-6143US

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Figure 7

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Figure 8

Filter 180101A 2p127   Hybridisation 24/01/01 2p137   Probe: OtS1-B7-cDNA 47-51 = 1101 bp cDNA (+1: ATG; +978: TAG)
A: EtBr; B, C: 2 and 5 day exposures; D: interpretation (predicted bands red); E: idem, only predicted bands

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Figure 9

BASE COUNT   6308 a   4234 c   4316 g   4761 t
ORIGIN

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 121 gaactccaca taaaaccaga gacactgaaa cttatagagg agaaagtggg gaaaagcctc
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1981 gttttttgta ttacagatct cttaggcatc tcttctttta attaaaacgt aaaaacataa
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3061 ctaatctgac tttgcagttt cccagctacc acagtgcaat gaggtttgag gaatgtttcc
3121 acccatcagt cagaaatcct gaccacaggt tctcaataga gaggtgcatg agaacagcaa
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Figure 9, Contd.

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Figure 9, Contd.

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8881 gggccctgac tcaggagagt ttgaaggcta atcaggcaca agatcacagg catcctaacc
8941 cacttcccca acagtccgcc tgtgtcgact ctgcccctgg gactggacat tcctcctagg
9001 aaattgttac ttcttctcca agtcccagcg gaactggaat gacgccgtca cagcttgcaa
9061 agaagtgaag gctcaactag tcatcatcaa tagtgatgaa gagcaggtac attagtggg
9121 actccatcct tgtctggtct gtgcacctgg ctcctgatca cataagctta agataatttg
9181 ccagagttat gtgaggaaaa gaagagacgg gggtcctgag ccctttagat agaacatttg
9241 tgagtgcttt ggggacacct aaaatgcagt agatatcatc tttgtactgg tcactattta
9301 gccatctcct cttggagaga taaaagtctt ggtgtgcctg ctaattaaat agcacagcag
9361 acaaagtgct tgcctctaag cctcacaccc tgagttcaat tcctaggacc cccgtggtaa
9421 taggagagaa tcaactcttt aagatgccct ctgacagaca tacctgcact gtggcatatg
9481 cccatccaga catagaagta gacataatta taagaaaaaa tgaagtcctg acatgggtct
9541 gcttcacaag cttgaagacc ttgagttcaa atccaaagat aaagaggaat ggggtgagat
9601 ggctcagtag atgaaggcgc ttgctgccaa gcctgacaat ttatcctctg aacctacatg
9661 gttcagagaa ccaacccta taaattgtcc tttgacctct atgtacaggc atattaatat
9721 ccataagaca tatacataga taagcatgca tacacgcata acctgatatg atatgtaatt
9781 ctcctggtgt aaatattctc accatgacag cttcaagttt ataatgggat gccactgaag
9841 aactgaaaag aaagggtatg tttcttaggt aaccatgaat tagcatcatt tgcttctatc
9901 acattaaagc cagccatgag gaaattctat agactcattc tatagactca gaattcttaa
9961 gagccatcca gcaacattag cagaattggg gagggatgaa cagctgtgta attcgtgtgt
```

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Figure 9, Contd.

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10021 gtgcgtgtgt gtgtgtgtgt gtgtgtgtgt gtgtgtgtgt gtgtgtgtgt gttgctatct
10081 ttcagacagg gtctcactct agttctatct ggcctggaac tcacagaaat cctgtgggtt
10141 tctgagatta aaggcatgta ccgtcatgtc catgcagcta ggtaccaccc tatgccaagt
10201 gaatgtactg ccataggcta cagatgtaaa aatagctgac accatctaag cacacatgag
10261 tactcatggc ctgatatagc ataaggggaa aagataatgt tgtaagtaga agtttctgcc
10321 tgaggttggg gagacaagct gaaagtagga aactctcccc tgactgtcct cctctttacc
10381 tccagacctt cctgcagcag acttctaagg ctaaaggacc aacctggatg ggcctgtcag
10441 acctgaagaa ggaggccacg tggctctggg tagatggttc tactctgtca tccaggtaga
10501 tccagtgaac aaccagtagt gtagtccaga caggtctctg atgttctgat agctacctgt
10561 gagtctcatc ctcttcttcc tcacctctta gaaataagag ccacccatat tagctgatgg
10621 aaggaagttt tcctacccat gcacagatag aatatcagca aatcccacca tcaaagcaac
10681 aagaaaaact tccccctgag gggtgttaat tttaatgtag gctattagta gaaaatacaa
10741 aataaagtaa ggccacaggg taaggggact attaacattg aaagatatat tattgggttg
10801 gggatataaa tatgttcatt aagtagcata aggtttgatc cccccattgc atagtctgat
10861 atggtggtcc atgcctataa caccagcagt tggaaggtag agggagaaga atcagttcaa
10921 tgttatcttc agctacaaaa tgggttctga gacagcctga gctacacagg aaggaagggg
10981 gagagagaaa gagaaagca ggtagggaag gaaatgtaaa gaaggggaag aggacaacag
11041 tagcttaaag ggagtttata tggatgttca ccgatcccac agcacaacac agagaacatg
11101 gggaagaacc acaacaaatc agaataaaaa ggaaggacac actgtgggaa agaacctta
11161 ctttgttgtc catgcataag aacaggagag actggcttgg catctattag tttaccattt
11221 taactttctg atccctaatt gtcttacaca tgcttggcat gtggcagatg tattgtggac
11281 cagaatgcaa gaacccagta aggaaggcaa aatccagatt gattggttta caccacaaaa
11341 ataaaataaa ataaaataaa ataaaataaa ataaaataaa ataaaataaa ataaaataaa
11401 atagaaaaac ccacaccact ccttcaatgt aggatataac aagagtcatt ttccaaagcc
11461 agcagaccca ggcatgcccc catctccaga ggaaggccca tctacaatat gcattctgga
11521 aggaggtaaa gacattgagt ttcagaaagc taaaaatatg gcatggttca cagcatgcca
11581 ctggagcaga ctaacgtttt tctggctgac tttccagatt ccagaaatat tggaatagag
11641 gggagcctaa caacatcggt gaggaagact gtgtcgaatt tgctggggat ggctggaatg
11701 actctaaatg tgaactcaaa aagttctgga tctgcaagaa gtctgcaacc ccatgcactg
11761 aaggctagct catctccgct cctaccttca tgccattctg ccaggcacat ggatgtgcct
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12061 atcaacagcc aggaggagac agaagtatgt gcaagctaac gcacacattt gcttattctc
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12181 gttggctaga tgttcccacc tctgttaact tcaataagac aagcccccac agacatgctc
12241 actggccaac ccaatgcagg caatacacca ttgagcctct tcccaggtga ctatacgctg
12301 tgtcaggctg actatcacaa agggactcac tattgtcctt ttgctttcag gtttctctgg
12361 gcttagggct cactgttgtc cccccacttc agtgcagtta cctgatgtag gatgctttca
12421 gaatctgggt gttttccatt aacctactcc atcttccttg ctgagacaca tacactcaaa
12481 ggtcagaaga agacattggt gttctctttg atagctcttt actcccttga gacaggagtt
12541 ggagttcatt attttttag caaggctggt gatctgaaag atccaacatt tttctgtctc
12601 cactcacctc ctaaatgaag ttacagtcac atgtggccat gtctggcctc taacaattac
12661 tagggcttca aggtcaggcc ctctttcttg cacatcagca ctcttatcca ctaagcatct
12721 ccccagccat ttgtctattg tcaggtagtc tagtttactg ttgctgtaat aaagtcctga
12781 caaaatgcaa gttggaagag aaatggatta tttgacttac aattctagat tgtagctcat
12841 ccctgcagga atatcaagga aggaacttga atcagctcat gatattacat ccaaaagcag
12901 agagaataag ttgcatgcat gcctaatttt tctactgcaa tacagtcgcc caactccaga
12961 gaatggtgct gccatattag gatgggtttc tgttcaattg acttaagaca atgacccccc
13021 ccatggatat ttctgcaacc tcgcccaaaa tagaccttat tgaggtatat tcttctaggt
13081 tgtgtcaaac tggcaactaa agctaaccat cacatcaagt cctatctgcc tagtcccta
13141 agacttgatc ctatctctgt atactttcat tctatctgtt cacttacatc aacctgcctg
13201 aaaactttg gctaggaacc ttccctggcc tctgtagctc atcatgcaaa ctaaagcatg
13261 aagatcattc ttcttctcca tctatgactt ccaggcatca tcacacaaat atttcagctc
13321 aggtgctgga gaaacggctc agcagttaag aatgcactca ttgctctcct agaggagcat
13381 agctctcagc aatcgtacct gatgaaactc cagctccagg gaatctatca ccctttttatg
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Figure 9, Contd.

```
13441 gcttctgtgt gcatttgaac ttatgtgggg tataaacaca catacacaca cattgtacat
13501 gttatatata tatattatat atacatatat acatacacac atatgtatat gtataatcag
13561 ctggttccta tcttggagat atcatggtgg atactgagag ctccaagatt tctcctcaga
13621 agagaatgtc ttttccttct attagacagt attctattct attccaattg atctgtgggg
13681 tgtgtgtgct gtgtgtgtgt gtttgtgtgt gtgcacgcgc gcgtgcatgc gcatgcacat
13741 acacaggtac cacgatttat tttttattac tatggctggg gcagaagtca ctgagaccct
13801 tctttaagat ccctattagc aaactccata attttcccag aaactatcca taaagttggt
13861 tttccagcat ctgacacaat ctgttcaggc ctttggctgt gactgtttgt ggctttggtt
13921 gtggctgtgg ccgtggctgc attcactgaa atatctatga ccagtccctt aagattgttg
13981 aaagccatat ttagaatgta gcttgtcaat atgaccattt atgaaaacag cagtactaag
14041 tttcctccag gtgtatggcc tcaccagctg tggatttttg gtcaaatttt gtaccagtca
14101 tgaattcctt cctaaagaga aggcatcaat acagtaagaa atagttggac actcccataa
14161 cagtcatgca tcagtggaaa catatttaat aaagaaaata caacacacaa ccacttttcc
14221 aaacaacttt tgctttattt gtttttttaa aaagaaagcc aatatttact tttcatcttt
14281 agtcttaata taaattttaa aaagatgtgt gtgaatacct ttttgcacat tcctttccta
14341 atgcctttta tctcagctga acatctcaac ttcttgtcgt tgcttcttca tcttaacatc
14401 tgtatttcca ctctcctctg gacttaatat ctggtcccac aactccacct aaaaattctg
14461 tctctactgg aggccacatt ggtactagga actccaaaag tctcctgatc taccaaagac
14521 cacactggca ttaggaaaca aacaaacaaa caaacaaaca aacaaaacaa aacttcagtt
14581 acctggaacc tcagagggca tgccagttcc cagaacccca gaatttcaga ggttagttca
14641 catagggcac caaaccactg atggagacac actactagac ctgaagactt attggtcatc
14701 agaaccatag gttactcaaa ccagaagacc agaaaggaaa ccaaagcagt gggaaaaaac
14761 atccaacaaa gataaagtca gcaatgatca cctaaacata taataaccaa acccagatga
14821 ctagaggcca gcatatgaac acagtcaaca atatccaagg caatacatca ccaccagagc
14881 tatcctccta cagaaagcac tgaatttttt taacacagct gaagcacatg aaaattacct
14941 taaatccaat cttatgaaga taatagagac ctttaaagaa gaaatacaaa aaaaaaaaac
15001 cttaaacaaa tcagggtgag agtaagggag gcaaacagat aaaggaatgt gtttaagatg
15061 tgaaaataga aatagacgaa taaatgaaat acaaactgat ggaatactgg aaatggaaaa
15121 tctaggtaag ttaacagaac ctacagacag aagtatcact aacagaatac aagagatgga
15181 aaaggatatc aggcatagaa gataagatag aagaaactaa tatggcattt aaaaaatgtt
15241 atatctaaaa aggtcctgac acaaaatgtt caggaaatca aggaacctat aaagagacca
15301 aacctaagaa caataggaat agaagaggga gatttccagc tcagaattct taggaaaaaa
15361 tacctaacct aaagaaggtg atgcctataa aggtacaaga aacatacaga agaccaaata
15421 tgttggacca gaaaagaaag tcttcccaag agataataat caaaacacta aatgtacaga
15481 gggaagaata ttaaaagcta aaagaggaaa aggcacaaaa aaaaccaaca acaacaacaa
15541 aaacatgtaa aggcaaacct agtagaatta tgccctactt ctcaacagaa aatctaaaaa
15601 gctagaaaag catggacaga tgtattacaa actctgagag accacagata tcagcccaga
15661 cgactgtaac aagcaaaact ttcaatcacc atagatggag aaaacaagat attctatgtc
15721 aaacccaaat ctaaatacga tctttctatt aatccagccc tacagaggct acaagaagga
15781 aaacttcgtt ggtccgggac ccgccgaact taggaaatta gtctgaacag gtgagagggt
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15961 aggggaggcg gcctaagcca cagcagcagc ggtcgccatc ttggtccggg acccgccgaa
16021 cttaggaaat tagtctgaac aggtgagagg gtgcgccaga gaacctgaca gcttctggaa
16081 caggcagaag cacagaggcg ctgaggcagc accctgtgtg ggccggggac agccggccac
16141 cttccggacc ggaggacagg tgcccacccg gcaggggagg cggcctaagc cacagcagca
16201 gcggtcgcca tcttggtccg ggacccgccg aacttaggaa attagtctga acaggtgaga
16261 gggtgcgcca gagaacctga cagcttctgg aacaggcgga agcacagagg cgctgaggca
16321 gcaccctgtg tgggccgggg acagccggcc accttccgga ccagaggaca ggtgcccacc
16381 cggctgggga ggcggcctaa gccacagcag cagcggtcgc catcttggtc cgggacccgc
16441 cgaacttagg aaattagtct gaacaggtga gaggtgcac cagagaacct gacagcttct
16501 ggaacaggca gaagcacaga ggcgctgagg cagcaccctg tgtgggctgg ggacagccgg
16561 ccaccttccg gaccagagga caggtgcccg cccggctggg gaggcgacct aagccacagc
16621 agcagcggtc gccatcttgg tccgggaccc gccgaactta gggaattagt ctgaacaggt
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Figure 9, Contd.

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16861 ccgccgaact taggaaatta gtctgaacag gtgagagggt gcgccagaga acctgacagc
16921 ttctggaaca ggcagaagca cagaggcgct gaggcagcac cctgtgtggg ccggggacag
16981 ccggccacct tccggaccgg aggacaggtg cccacccggc aggggaggcg gcctaagcca
17041 cagcagcagc ggtcaccatc ttggtcccgg gactccaagg aacttaggaa tttagtctgc
17101 ttaggtgaga gtctgtacca cctgggaact gccaaagcaa cacagtgtct gagaaaggtc
17161 ctgttttggg ccttcttctt cggccaggag gaggtccaaa tacaagatat ctgcgcacct
17221 tccctgtaag agagcttgcc agcagagagt gctctgagca ctgaaactca gaggagagaa
17281 tctgtctccc aggtctgctg atagacggta acagaatcac cagaagaaca atctctaaac
17341 agagtcaact ataactacta actccagaga ttaccagatg gcgaaaggta aacggaggaa
17401 tcttactaac aggaaccaag accactcacc atcaccagaa cccagcacac ccacttcgcc
17461 cagtccaggg aaccccaaca cacctgagaa cctagaccta gatttaaaag catatctcat
17521 gatgatggta gaggacatca agaaggactt taataaatca cttaaagaaa tacaggagaa
17581 cactgctaaa gagttacaag tccttaaaga aaaacaggaa aacacaatca aacaggtaga
17641 agtccttaca gaaaaagagg aaaaaacata caaacaggtg atggaaaatg aacaaaacca
17701 tactagacct aaaaagggaa gtagacacaa taaagaaaac tcaaagcgag gcaacgctag
17761 agatagaaac cctaggaaag aaatctggaa ccatagattt gagcatcagc aacagaatac
17821 aagagatgga agagagaatc tcaggtgcag aagattccat agagaacatc ggcacaacaa
17881 tcaaagaaaa tggaaaatgc aaaaagatcc taactcaaaa tatacaggaa atccaggaca
17941 caataagaag accaaacgta cggataaatag gagtggatga gaatgaagat tttcaactca
18001 aaggtccagc aaacatcttc aacaaaatta ttgaagaaaa cttcccaaat ctaaagaatg
18061 agatgcatat gaacatacaa gaagcctaca gaactccaaa tagactggac cagaaaagaa
18121 attcctcccg acacataata atcagaacat caaatgcact aaataaagat agaatactaa
18181 aagcagtaag ggaaaaaggt caagtaacat ataaaggcaa gcctatcaga attacaccag
18241 attttttcacc agagactatg aaagccagaa gagcctggac agatgttata cagacactaa
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18421 cccttcaaag gataataaca gaaaaaaacc aatacaagaa cgggaacaac gccctagaaa
18481 aaacaagaag gtaatccctc aacaaaccta aagaagaca gccacaagaa cagaatgcca
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18601 aatggtctca actcgccaat aaaaagacat agactaacaa ctggctacac aaacaagacc
18661 caacattttg ctgcttacag gaaactcatc tcagagaaaa agatagacac tacctcagaa
18721 tgaaaggctg gaaacaattt tccaagcaaa tggtatgaag aaacaagcag gagtagccat
18781 cctaatatct gataagatga cttccaaccc aaagtcatca aaaaagacaa ggagggacac
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18961 gcgcctcaca caataatagt gggagacttc aacacaccac tttcaccaat ggacagatca
19021 tggaaacaga aactaaacag ggacacactg aaactaacag aagtgatgaa acaaatggat
19081 ctgacagata tctacagaac attttaccct aaaacaaaag gatatacctt cttctcagca
19141 cctcatggta ccttctccaa aattgaccac ataataggtc acaaatcagg cctcaacaga
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19261 ttcaataaca aaataaataa cagaaagcca acattcacat ggaaactgaa caacactctt
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19441 gggaaactca tagctatgag tgccttcaag aaaaaacggg agagagcaca tactagcagc
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19561 caggatataa tcaaactcgg ggtgaaatca accaagtgaa cagagactat tcagatacc
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Figure 10

```
  1   MSDSTEAKMQ PLSSMDDDEL MVSGSRYSIK SSRLRPNSGI KCLAGCSGHS QVPLVLQLLS    60
 61   FLFLAGLLLI ILFQVSKTPN TERQKEQEKI LQELTQLTDE LTSRIPISQG KNESMQAKIT   120
121   EQLMQLKTEL LSRIPIFQGQ NESIQEKISE QLMQLKAELL SKISSFPVKD DSKQEKIYQQ   180
181   LVQMKTELFR LCRLCPWDWT FLLGNCYFFS KSQRNWNDAV TACKEVKAQL VIINSDEEQT   240
241   FLQQTSKAKG PTWMGLSDLK KEATWLWVDG STLSSRFQKY WNRGEPNNIG EEDCVEFAGD   300
301   GWNDSKCELK KFWICKKSAT PCTEG                                        325
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Figure 11

Sequence format is Pearson
Sequence 1: AAF77072   404 aa
Sequence 2: OtB7-ORF   325 aa
Sequences (1:2) Aligned. Score: 45

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AAF77072    MSDSKEPRLQQLGLLEEEQLRGLG---------FRQTRGYKSLAGCLGHG--PLVLQLLS  49
OtB7-ORF    MSDSTEAKMQPLSSMDDDELMVSGSRYSIKSSRLRPNSGIKCLAGCSGHSQVPLVLQLLS  60
            ****.*.::* *. :::::*    *          :* . * *.**** **. *******


AAF77072    FTLLAG----LLVQVSKVPSSISQEQSRQDAIYQNLTQLKAAVGELSEKSKLQEIYQELT  105
OtB7-ORF    FLFLAGLLLIILFQVSKTPN--TERQKEQEKILQELTQLT---DELTSR----------  104
            * :***     :*.****.*. ::.*..*: * *:****.  .**:.:


AAF77072    QLKAAVGELPEKSKLQEIYQELTRLKAAVGELPEKSKLQEIYQELTWLKAAVGELPEKSK  165
OtB7-ORF    ---IPISQGKNESMQAKITEQLMQLKTEL------------------------------  130
               .:.:· ::*   :* ::* :**: :


AAF77072    MQEIYQELTRLKAAVGELPEKSKQQEIYQELTRLKAAVGELPEKSKQQEIYQELTRLKAA  225
OtB7-ORF    -------LSRIPIFQGQN--ESIQEKISEQLMQLKAEL--LSKISSFP-----------  167
                   *:*:     *:   :* *::* ::* :***  :   *.: *.


AAF77072    VGELPEKSKQQEIYQELTQLKAAVERLCHPCPWEWTFFQGNCYFMSNSQRNWHDSITACK  285
OtB7-ORF    ---VKDDSKQEKIYQQLVQMKTELFRLCRLCPWDWTFLLGNCYFFSKSQRNWNDAVTACK  224
               : :.***::***:*.*.*:* : ***: ***:***: *****:*:*****:*.::****


AAF77072    EVGAQLVVIKSAEEQNFLQLQSSRSNRFTWMGLSDLNQEGTWQWVDGSPLLPSFKQYWNR  345
OtB7-ORF    EVKAQLVIINSDEEQTFLQ-QTSKAKGPTWMGLSDLKKEATWLWVDGSTLSSRFQKYWNR  283
            ** ****:*:* ***.*** *:*::: ********::*.** *****.*  *::****


AAF77072    GEPNNVGEEDCAEFSGNGWNDDKCNLAKFWICKKSAASCSRDEEQFLSPAPATPNPPPA  404
OtB7-ORF    GEPNNIGEEDCVEFAGDGWNDSKCELKKFWICKKSATPCTEG-----------------  325
            *****:*****.**:*:****.**:* ********:.*:..
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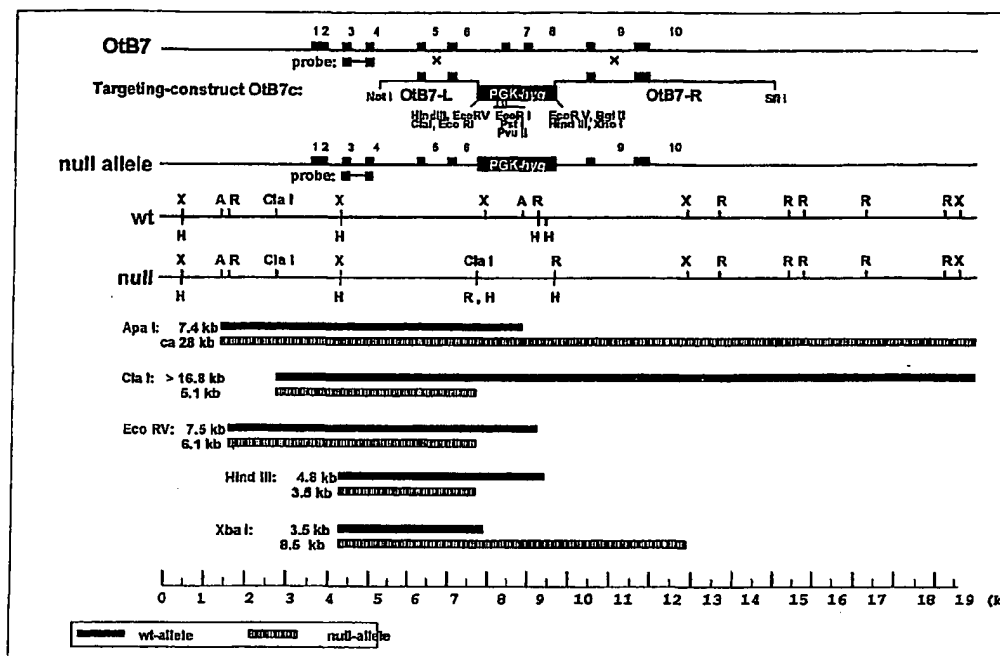
TITLE: GENES INVOLVED IN IMMUNE RELATED RESPONSES
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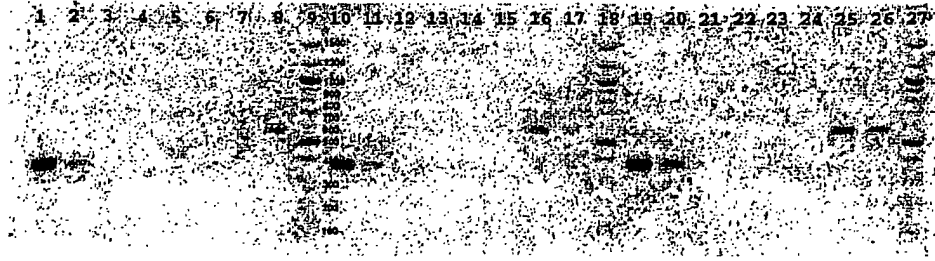Inventor: Grout et al.
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Figure 12

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Figure 13

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FIGURE 14

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Gob-5    --MESLKSPVFLLILHLLEGVLSESL------IQLNNNGYEGIVIAIDHDVPEDEALIQH  52
HuCLCA1  --MGPFKSSVFILILHLLEGALSNSL------IQLNNNGYEGIVVAIDPNVPEDETLIQQ  52
HuCLCA4  --MGLFRGFVFLLVLCLLH-QSNTSF------IKLNNNGFEDIVIVIDPSVPEDEKIIEQ  51
MuCaCC   --MVPGLQVLLFLTLHLLQ-NTESSM------VHLNSNGYEGVVAINPSVPEDERLIPS   51
HuCLCA2  MTQRSIAGPICNLKFVTLLVALSSELPFLGAGVQLQDNGYNGLLIAINPQVPENQNLISN  60
             :  *  : *    . .:     ::*:.**::.::: .*: .***:: :*

Gob-5    IKDMVTQASPYLFEATGKRFYPKNVAILIPESWKAKPEYTRPKLETFKNADVLVSTTSPL  112
HuCLCA1  IKDMVTQASLYLFEATGKRFYPKNVAILIPETWKTKADYVRPKLETYKNADVLVAESTPP  112
HuCLCA4  IEDMVTTASTYLFEATEKRFFPKNVSILIPENWKENPQYKRPKHENHKHADVIVAPPTLP  111
MuCaCC   IKEMVTQASTYLFEASQGRVYFRNISILVPMTWKSKPEYLMPKRESYDKADVIVADPHLQ  111
HuCLCA2  IKEMITEASFYLFNATKRRVFPRNIKILIPATWKAN-NNSKIKQESYEKANVIVTDWYGA  119
         *::*:* ** ***:*: *.:*:*: **:* .** : :    * *...:*:*:*:

Gob-5    GNDEPYTEHIGACEEKGIRIHLTPDFLAGKKLTQ-YGPQDRTFVHEWAHFRWGVFNEYNN  171
HuCLCA1  GNDEPYTEQMGNCEEKGERIHLTPDFIAGKKLAE-YGPQGKAFVHEWAHLRWGVFDEYNN  171
HuCLCA4  GRDEPYTKQFTECEEKGEYIHFTPDLLLGKKQNE-YGPPGKLFVHEWAHLRWGVFDEYNE  170
MuCaCC   HGDDPYTLQYGQCEDRGQYIHPTPNFLLTDNLRI-YGPRGRVFVHEWAHLRWGVFDEYNN  170
HuCLCA2  HGDDPYTLQYRGCGKEGKYIHFTPNFLLNDNLTAGYGSRGRVPVHEWAHLRWGVFDEYNN  179
         *:*** :    *:..*  **:**::: ..:    **. .: ******:;*****:***

Gob-5    DEKFYLSKGK-PQAVRCSAAITGKNQVRRCQGGSCITNGKCVIDRVTGLYKDNCVFVPDP  230
HuCLCA1  DEKFYLSNGR-IQAVECSAGITGTNVVKKCQGGSCTTK-RCTPNKVTGLYEKGCEFVLQS  229
HuCLCA4  DQPFYRAKSKKIEATPCSAGISGRNRVYKCQGGSCLSR-ACRIDSTTKLYGKDCQFFPDK  229
MuCaCC   DQPFYNSRKNTIEATPCSTRITGTNVVHNCSRGNCVTR-ACERDSKTRLYEPKCTFIPDK  229
HuCLCA2  DKPFYINGQNQIKVTECSSDITG---IFVCEKGPCPQE-NCIIS---KLFKEGCTFIYNS  232
         *: **     . :..*:*: *:*    :  *     *    * . . *: * *. :

Gob-5    HQNEKASIMFNQNINSVVEFCTEKNHNQEAPNDQNQRCNLRSTWEVIQESEDFKQTTPM-  289
HuCLCA1  RQTEKASIMFAQHVDSIVEFCTEQNHNKEAPNKQNQKCNLRSTWEVIRDSEDFKKTTPM-  288
HuCLCA4  VQTEKASIMFMQSIDSVVEFCNEKTHNQEAPSLQNIKCNFRSTWEVISNSEDFKNTIPM-  288
MCaCC    IQTAGASIMFMQNLNSVVEFCTEKNHNAEAPNLQNKMCNRRSTWDVIKTSADFQNAPPMR  289
HuCLCA2  TQNATASIMFMQSLSSVVEFCNASTHNQEAPNLQNQMCSLRSAWDVITDSADFHHSFPMN  292
         *.  ***** *  :.*:****.  ..** ***.** *. **:*:** * **::: **

Gob-5    -TAQPPAPTFSLLQIGQRIVCLVLDKSGSMLNDDRLNRMNQASRLFLLQTVEQGSWVGMV  348
HuCLCA1  -TTQPPNPTFSLLQIGQRIVCLVIDKSGSIATGNRLNRLNQAGQLFLLQTVELGSWVGMV  347
HuCLCA4  -VTPPPPPVFSLLKIRQRIVCLVLDKSGSIGGKDRLNRMNQAAKHFLLQTVENGSWVGMV  347
MCaCC    GTEAPPPPTFSLLKSRRRVVCLVLDKSGSIDKEDRLIRMNQAAELYLTQIVEKESMVGLV  349
HuCLCA2  GTELPPPPTFSLVQAGDKVVCLVLDVSSKIAEADRLLQLQQAAEFYLMQIVEIHTFVGIA  352
         .   ** *.***::   ::****:::*.      :**  ::**.. :* * **  : **:.
```

```
Gob-5    TFDSAAYVQSELKQLNSGADRDLLIKHLPTVSAGGT--SICSGLRTAFTVIKKKYP-TDG  405
HuCLCA1  TFDSAAHVQSELIQINSGSDRDTLAKRLPAAASGGT--SICSGLRSAFTVIRKKYP-TDG  404
HuCLCA4  HFDSTATIVNKLIQINSSDERNTLMAGLPTYPLGGT--SICSGIYAFQVIGELHSQLDG   405
MCaCC    TFDSAAHIQNYLIKITSSSDYQKITANLPQQASGGT--SICHGLQAGFQAITSSDQSTSG  407
HuCLCA2  SFDSKGEIRAQLHQINSNDDRKLLVSYLPTTVSAKTDISICSGLKKGFEVVEKLNGKAYG  412
         ***  . :    * ::.*. : . :  **    . *  *** *:: .*  .:  .    *
```

```
Gob-5    SEIVLLTDGEDNTISSCFDLVKQSGAIIHTVALGPAAAKELEQLSKMTGGLQTYSSDQVQ  465
HuCLCA1  SEIVLLTDGEDNTISGCFNEVKQSGAIIHTVALGPSAAQELEELSKMTGGLQTYASDQVQ  464
HuCLCA4  SEVLLLTDGEDNTASSCIDEVKQSGAIVHFIALGRAADEAVIEMSKITGGSHFYVSDEAQ  465
MCaCC    SEIVLLTDGEDNGIRSCFEAVSRSGAIIHTIALGPSAARELETLSDMTGGLRFYANKDLN  467
HuCLCA2  SVNILVTSGDDKLLGNCLPTVLSSGTIHSIALGSSAAPNLEELSRLTGGLKFFVPDISN   472
         * ::*:*.*:*:   .*:  . ** :* :*** :*   : :* :*** : :  . :
```

```
Gob-5    NNGLVDAFAALSSGNAAIAQHSIQLESRGVNLQNNQWMNGSVIVDSSVGKDTLFLITWTT  525
HuCLCA1  NNGLIDAFGALSSGNGAVSQRSIQLESKGLTLQNSQWMNGTVIVDSTVGKDTLFLITWTT  524
HuCLCA4  NNGLIDAFGALTSGNTDLSQKSLQLESKGLTLNSNAWMNDTVIIDSTVGKDTFFLITWNS  525
MCaCC    --SLIDAFSRISSTSGSVSQQALQLESKAFDVRAGAWINGTVPLDSTVGNDTFFVITWMV  525
HuCLCA2  SNSMIDAFSRISSGTGDIFQQHIQLESTGENVKPHHQLKNTVTVDNTVGNDTMFLVTWQA  532
         .: ***. ::*  . : *: :****  . :.   ::.:* :*:.**:**:*::**
```

```
Gob-5    H-PPTIPIWDPSGV--EQNGFILDTT-TKVAYLQVPGTAKVGPWKYSIQASS---QTLTL  578
HuCLCA1  Q-PPQILLWDPSGQ--KQGGFVVDKN-TKMAYLQIPGIAKVGTWKYSLQASS---QTLTL  577
HuCLCA4  L-PPSISLWDPSGT--IMBNFTVDAT-SKMAYLSIPGTAKVGTWAYNLQAKAN-PETLTI  580
MCaCC    K-KPEIILQDPKGKKYTTSDFQDDKLNIRSARLQIPGTARTGTWTYSITGTKS--QLITM  582
HuCLCA2  SGPPEIILFDPDGRKYYTNNFITNLT-FRTASLWIPGTAKPGHWTYTLNNTHHSLQALKV  591
         * * : **.*    .* :   : * * ;** *: * * *.: .    : :.:
```

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OBSERVED WITH ASTHMA
Inventor: Grout et al.
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FIGURE 14, CONTD.

```
Gob-5      TVTSRAASATLPPITVTPVVNKNTGKFPSPVTVYASIRQGASPILRASVTALIESVNGKT 638
HuCLCA1    TVTSRASNATLPPITVTSKTNKDTSKFPSPLVVYANIRQGASPILRASVTALIESVNGKT 637
HuCLCA4    TVTSRAANSSVPPITVNAKMNKDVNSFPSPMIVYAEILQGYVPVLGANVTAFIESQNGHT 640
MCaCC      TVTTRARSPTMEPLLATAHMSQSTAQYPSRMIVYARVSQGFLPVLGANVTALIEAEHGHQ 642
HuCLCA2    TVTSRASNSAVPPATVEAFVERDSLHFPHPVMIYANVKQGFYPILNATVTATVEPETGDP 651
           *··:·· ..:: *   .. ..:.   :*  : :** : **  *:* *.*** :*. *.

Gob-5      VTLELLDNGAGADATKNDGVYSRFFTAFDANGRYSVKIWALGGVTSDRQRAAPPKNRAMY 698
HuCLCA1    VTLELLDNGAGADATKDDGVYSRYFTTYDTNGRYSVKVRALGGVNAARRRVIPQQSGALY 697
HuCLCA4    EVLELLDNGAGADSFKNDGVYSRYFTAYTENGRYSLKVRAHGGANTARLKLRPPLNRAAY 700
MCaCC      VTLELWDNGAGADTVKNDGIYTRYFTDYHGNSRYSLKVRVQAQRNKTRLSLR-QKNKSLY 701
HuCLCA2    VTLRLLDDGAGADVIKNDGIYSRYFFSFAANGRYSLKVHVNHSPSISTPAHSIPGSHAMY 711
           .*.* *:r**** *;**:*:*:* : *.***:*: .   .  . : *

Gob-5      IDGWIEDGEVRMNPPRPETS--YVQDKQLCFSRTSSGGSFVATNVPAAAPIPDLFPPCQI 756
HuCLCA1    IPGWIENDEIQWNPPRPEINKDDVQHKQVCFSRTSSGGSFVASDVPN-APIPDLFPPGQI 756
HuCLCA4    IPGWVVNGEIEANPPRPEID-EDTQTTLEDFSRTASGGAFVVSQVPS-LPLPDQYPPSQI 758
MCaCC      IPGYVENGKIVLNPPRPDVQEEAIEATVEDFNRVTSGGSFTVSGAPPDGDHARVFPPSKV 761
HuCLCA2    VPGYTANGNIQMNAPRKSVG-RNEEERKWGFSRVSSGGSFSVLGVPA-GPHPDVFPPCKI 769
           : *: :.:: *.** .   :      *.*.:***:* . .*    .   :** ::

Gob-5      TDLKASIQGQNLVNLTWTAPGDDYDHGRASNYIIRMSTSIVDLRDHFNTSLQVNTTGLIP 816
HuCLCA1    TDLNAEIHGGSLINLTWTAPGDDYDHGTAHKYIIRISTSILDLRDKFNESLQVNTTALIP 816
HuCLCA4    TDLDATVHEDKII-LTWTAPGDNFDVGKVQRYIIRISASILDLRDSFDDALQVNTTDLSP 817
MCaCC      TDLEAEFIG-DYIHLTWTAPGKVLDNGRAHRYIIRMSQHPLDLQEDFNNATLVNASSLIP 820
HuCLCA2    IDLEAVKVEEELT-LSWTAPGEDFDQGQATSYEIRMSKSLQNIQDDFNNAILVNTSKRHP 828
           ··*.* .    ·:*··*  . .  + . * ··:· :::: *: : **:: *

Gob-5      KEASSEEIFEFELGGNTFG----------NGTDIFIAIQAVDKSNLKSEISNIARVSVFI 866
HuCLCA1    KEANSEEVFLFKPENITFE----------NGTDLFIAIQAVDKVDLKSEISNIARVSLFI 866
HuCLCA4    KEANSKESFAFKPEHISEE----------NATHIFIAIKSIDKSNLTSKVSNIAQVTLFI 867
MCaCC      KEAGSKETFKFKPETFKIA----------NGIQLYIAIQADNEASLTSEVSNIAQAVKLT 870
HuCLCA2    QQAGIREIFTFSPQISTNGPEHQPNGETHESHRIYVAIRAMDRNSLQSAVSNIAQAPLFI 888
           ::*. .* * *.    .        :. ::::**:: :. .* * :****:. :

Gob-5      PAQEP---PIPEDSTPPCPDISINS--TIPGIHVLKIMWKWLGEMQVTLGLH------- 913
HuCLCA1    PPQTPPETPSPDETSAPCPNIHINS--TIPGIHILKIMWKWIGELQLSIA--------- 914
HuCLCA4    PQANP-DDIDPTPTPTPDKSHNSGVNISTLVLSVIGSVVIVNFILSTTI--------- 917
MCaCC      SLEDS---------------ISALGDISAICMTIWGLTVIFNSILN----------- 901
HuCLCA2    PPHSD----PVPARDYLILKGVLTAMGLIGIICLIIVVTHHTLSRKKRADKKENGTKLL 943
           .:  * : :       .
```

[ ] Conserved cysteines

VLLTDGED   von Willebrand factor type A domain

¶gnl|Smart|smart00327, VWA, von Willebrand factor (vWF) type A domain; VWA domains in
extracellular eukaryotic proteins mediate adhesion via metal ion-dependent adhesion sites
(MIDAS). Intracellular VWA domains and homologues in prokaryotes have recently been identified.
The proposed VWA domains in integrin beta subunits have recently been substantiated using
sequence-based methods (Ponting et al. Adv Prot Chem (2000) 54:185-244).

[ ]   MIDAS motif

Affinity regulation: MIDAS Bonds in CD11's

The metal ion-dependent adhesion site (MIDAS) is believed to be the site on the alpha
chain of LFA-1 (alpha-L, CD11a) which binds ligand (ICAM-1, ICAM-2, or ICAM-3).
Although it is likely to be a critical portion of the ligand-binding site, other parts
of LFA-1 may also make important contributions, notably the MIDAS site on CD18, and
the 4th and 5th repeats of CD11a. The MIDAS motif consists of DxSxS...T...D, and is
equally central to ligand binding for both CD11a/CD18 (LFA-1) and CD11b/CD18
(Complement receptor type 3, CR3).

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              Forward primer
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FIGURE 15

```
BE655906    AGTCACTGGCGATCTGAAAAGTGTCTAGAGCAGGATCTAGCTGACTCTAAGATTGCAGGG 60
OtS2-D10    ----------------------------GATCTAGCTGACTCTAAGATTGCAGGG 27
CD59        AGTCACTGGCGATCTGAAAAGTGTCTAGAGCAGGATCTAGCTGACTCTAAGATTGCAG-- 63
            .............................*************************

BE655906    TTGAAGGTGTCTGTGAAGCCTGTGGAAACTGCTGCTGTTAAAAATCTTCAATCTGGCTGGG 120
OtS2-D10    TTGAAGGTGTCTGTGAAGCCTGTGGAAACTGCTGCTGTTAAAAATCTTCAATCTGGCTGGG 87
CD59        ------------------------------------------------------------

BE655906    GATGTGGCTCAAGATAGTGCTGCATGGTGGCCTGGCTTGCGTTCTTCATATATTAAAAAT 180
OtS2-D10    GATGTGGCTCAAGATAGTGCTGCATGGTGGCCTGGCTTGCGTTCTCCATATATTAAAAAT 147
CD59        --------------------------------------------------------AT 65
                                                                    **

BE655906    TTGGTAGCCCAGCACAATGAGAGCTCAGAGGGGACTCATCTTACTCCTGCTGCTTCTGGC 240
OtS2-D10    TTGGTAGCCCAGCACAATGAGAGCTCAGAGGGGACTCATCTTACTCCTGCTGCTTCTGGC 207
CD59        TTGGTAGCCCAGCACAATGAGAGCTCAGAGGGGACTCATCTTACTCCTGCTGCTTCTGGC 125
            ************************************************************

BE655906    TGTGTTCTGTTCCACAGCTGTTAGCCTCACATGCTACCACTGTTTCCAACCGGTGGTTTC 300
OtS2-D10    TGTGTTCTGTTCCACAGCTGTTAGCCTCACATGCTACCACTGTTTCCAACCGGTGGTTTC 267
CD59        TGTGTTCTGTTCCACAGCTGTTAGCCTCACATGCTACCACTGTTTCCAACCGGTGGTTTC 185
            ************************************************************

BE655906    TTCATGCAATATGAACAGCACTTGCTCTCCTGACCAGGATTCCTGTCTCTATGCTGTAGC 360
OtS2-D10    TTCATGCAATATGAACAGCACTTGCTCTCCTGACCAGGATTCCTGTCTCTATGCTGTAGC 327
CD59        TTCATGCAATATGAACAGCACTTGCTCTCCTGACCAGGATTCCTGTCTCTATGCTGTAGC 245
            ************************************************************
                                               <-----------
                                               reverse

BE655906    CGGAATGCAAGTGTATCAAAGGTGTTGGAAACAATCAGATTGTCATG------------- 407
OtS2-D10    CGGAATGCAAGTGTATCAAAGGTGTTGGAAACAATCAGATTGTCATGGTGATC------- 378
CD59        CGGAATGCAAGTGTATCAAAGGTGTTGGAAACAATCAGATTGTCATGGTGAGATCATTAT 305
            **************************************************
            ----------
            primer
```
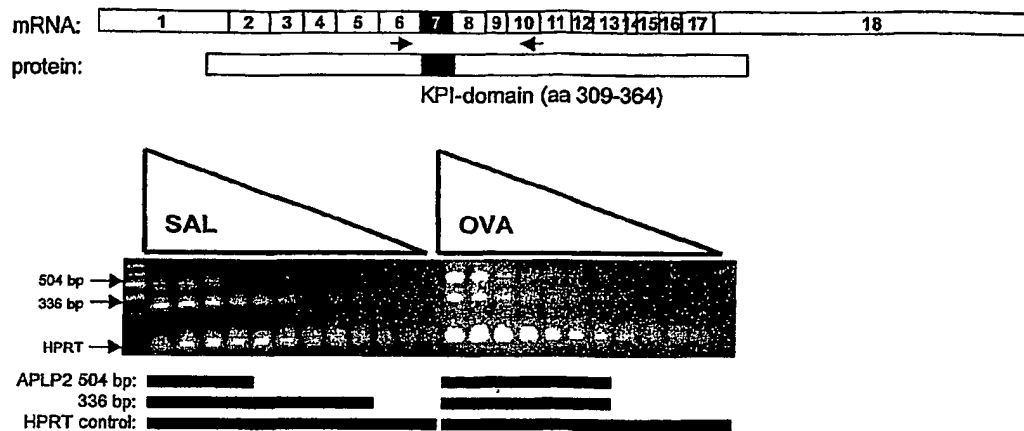
TITLE: GENES INVOLVED IN IMMUNE RELATED RESPONSES
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Inventor: Grout et al.
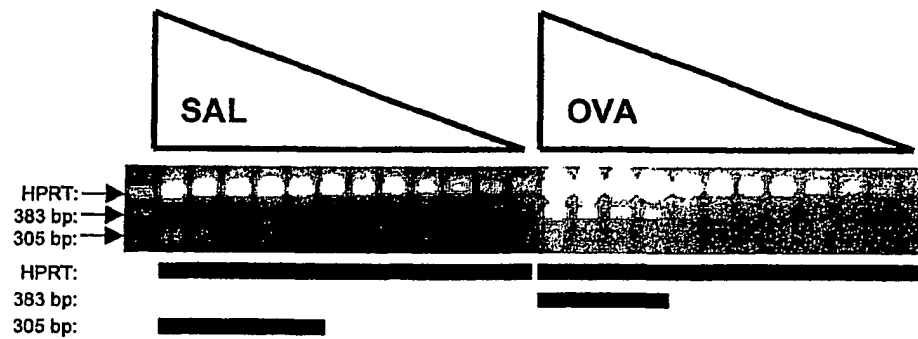Docket No.: 2183-6143US

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Figure 16

TITLE: GENES INVOLVED IN IMMUNE RELATED RESPONSES
OBSERVED WITH ASTHMA
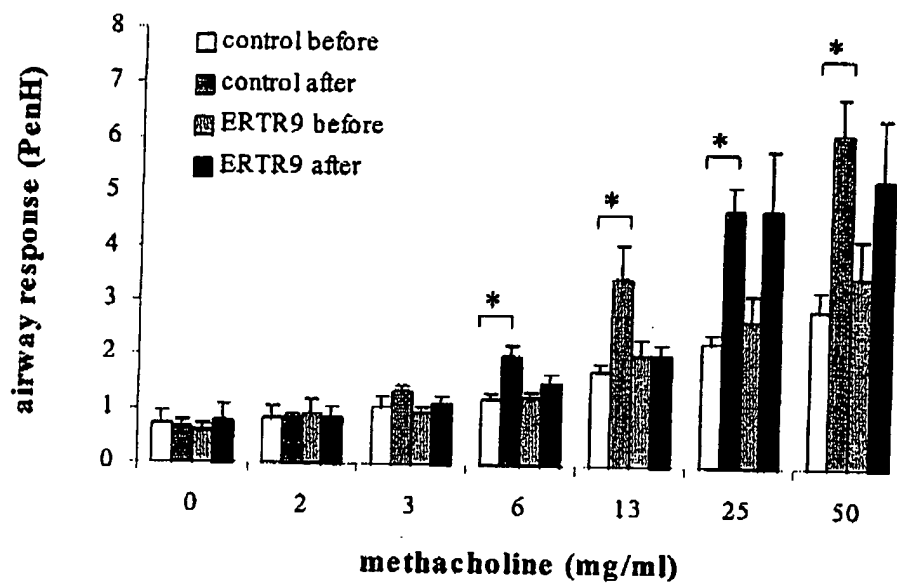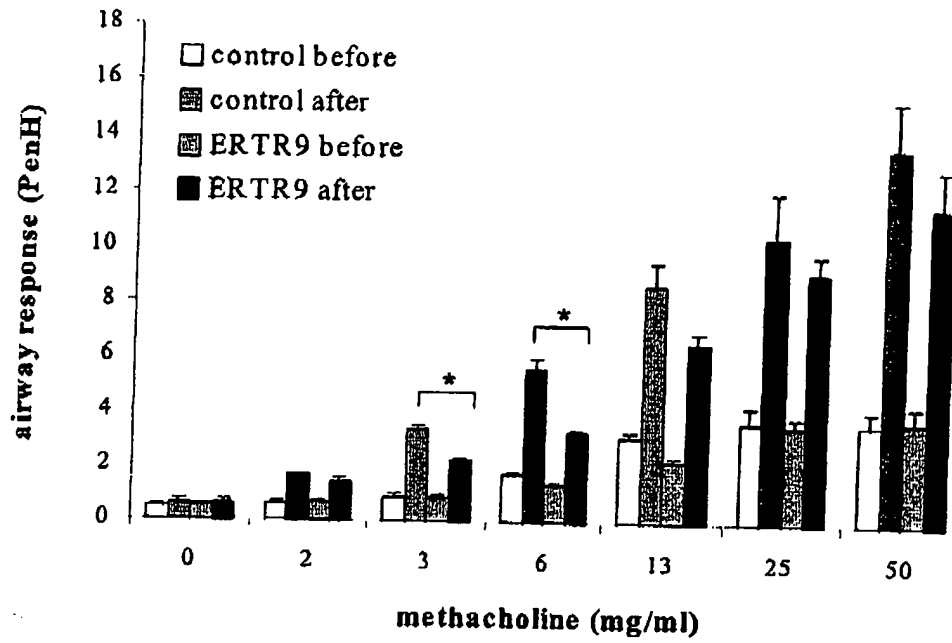Inventor: Grout et al.
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Figure 17

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Fig. 18A

TITLE: GENES INVOLVED IN IMMUNE RELATED RESPONSES
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Inventor: Grout et al.
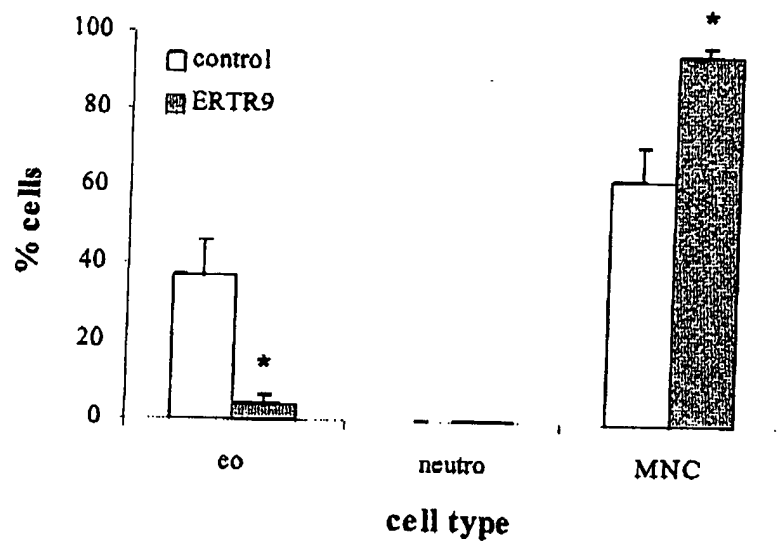Docket No.: 2183-6143US

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Fig. 18B

TITLE: GENES INVOLVED IN IMMUNE RELATED RESPONSES
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Fig. 19A

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Fig. 19B